



DirecTV Receivers Serial Control Module Application Guide






Description

This module allows you to control supported DirecTV receivers, including the D10, D11, D12, H10, R15, R16, H20, H21, HR20, HR21 and HR21P via serial control, including limited feedback.

Note that not all receivers implement the protocol in the same manner, so some functions may not work the same way on all models (for example, DVR controls on receivers without the DVR feature). Also, some models may require a special cable or USB adaptor to access the serial port. Additional information can be found in the "Hardware Configuration and Serial Pinout" section of this document.

Supported Processors

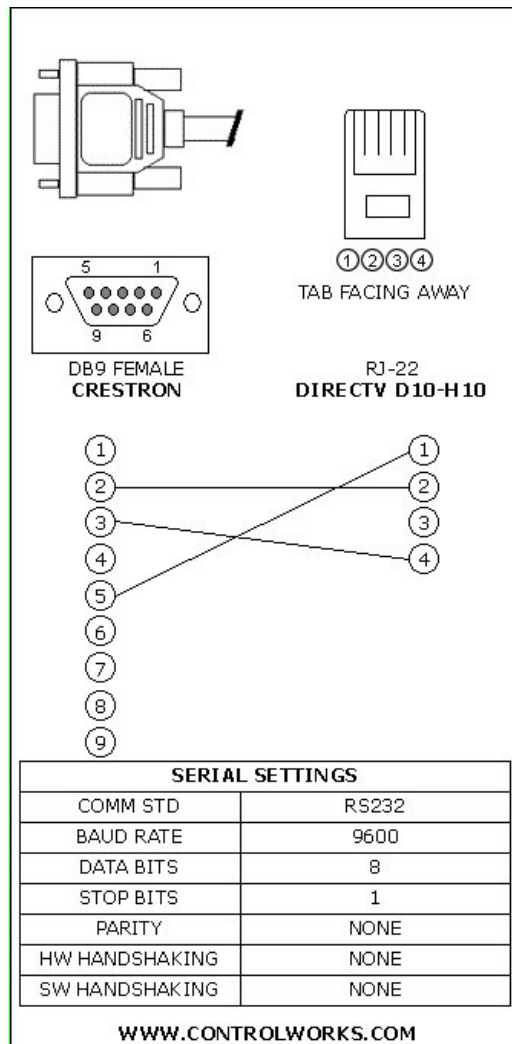
This module is supported on any 2-series processor with RS-232 serial ports. This module includes limited SystemBuilder compatibility; however ControlWorks does not support the use of our modules in the SystemBuilder environment.

Compatibility			Processor Requirements	
 2-Series Compatible	 NOT CNMSX Compatible	 System Builder Compatible (Limited)	 Ethernet NOT NEEDED	 Compact Flash NOT NEEDED

Hardware Configuration and Serial Pinout

RJ-22 Serial connection

If your receiver is a D10 or H10 then you should build your serial cable as indicated below. Note that the modular connector required is a RJ-22. This is the smaller modular connector that is used on telephone handset cords. This connector requires a special die in your crimper. A RJ-11/14 crimper will not work if you attempt to crimp a RJ-22 plug with it.



USB connection

The module supports serial control via a USB port for all other receivers. This module was tested with an IOGEAR GUC232A. DirecTV has also listed the ATEN UC-232A and the BAFO BF-810 as being compatible with the USB port on the receiver. **Please note that you must power cycle the HR20, HR21 and HR21P after plugging in the USB dongle in order for the USB driver to work correctly.** Using the red reboot switch will not load the driver. Also note that the LED on the dongle will not illuminate. When using a USB dongle you must pin your serial cable pin 2 to pin 3, pin 3 to pin 2 and pin 5 to pin 5. Pins 1,4,6,7,8 and 9 should not be connected in your cable.

Module Application

The module does not support IP connectivity for receivers equipped with Ethernet. This module allows bi-directional RS232 serial communication only. You can emulate the controls available from the remote control as well as view the current signal strength, channel number and rapidly tune to pre-set channels by using either an analog value or serial string. Other functions are available such as discreet power and user lockout controls. At this time we do not have support for discreet aspect ratios. DirecTV has reported to us that this functionality may be included in a future release.

Channel Presets

This module provides two mechanisms for tuning to preset channels via an analog and serial input to the module. Either the analog or serial input may be used to tune to standard channels, while the serial input may also be used to tune to channels with a sub-channel such as off the air high definition channels (example: 8-1),. The demonstration program includes samples of both methods.

If using an analog value, simply initialize the analog to the desired channel number, for example to tune to channel 202 initialize the analog to 202d. If using a serial value, send the serial string in the format of xxxx-y where "xxxx" is the channel number, and "y" is the sub-channel number (if no sub-channel, use 0). This string must always be exactly 6 characters, padded with zeros. For example, to tune to channel 202 use the serial string 0202-0; to tune to channel 8-1 use the serial string 0008-1.

Signal And Parameter Descriptions

Bracketed signals such as "[signal_name]" are optional signals

DIGITAL INPUTS

[power_on]	Pulse to turn the receiver on
[standby]	Pulse to put the receiver into the "standby" mode
[reboot]	Pulse to reboot the receiver, same as red reboot button on the receiver
[get_tuner_channel]	Pulse to poll for the current channel number (Note: The module will attempt to automatically poll for the current channel when enter, previous channel, or channel up or down is pressed)
[get_tuner_signal_quality]	Pulse to poll for the current signal quality reported by the tuner
[poll_for_status]	Pulse to poll for the current transponder number, primary type, audio type, and CAM (access card) ID.
[enable_user_controls]	Pulse to enable user controls via the remote control or front panel buttons
[disable_user_controls]	Pulse to disable user control from the remote control or front panel buttons
[key_(x)]	Performs the same function as the corresponding button on the DirecTV handheld remote control

ANALOG INPUTS

[tuner_tune_to_channel]	Analog input to tune to a channel number (for example 202d = tune to channel 202). Does not support subchannels. Note that certain receivers such as the HR20 will not display the channel banner when direct tuning.
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SERIAL INPUTS

directv_rx\$	Tie to RX\$ line of serial port that the DirecTV receiver is connected to
[tuner1_tune_to_channel\$]	Serial input to tune to a channel number. Must be 6 characters including one dash padded with 0s, for example 0008-1 = tune to channel 8-1. Note that certain receivers such as the HR20 will not display the channel banner when direct tuning.

DIGITAL OUTPUTS

[tuner_no_channel_minor_fb]	High when the current channel number does not include a minor channel component. See the demo program for an example of driving subpages based on this feedback.
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ANALOG OUTPUTS

[tuner_channel_major]	Indicates the current channel number that the receiver is tuned to
[tuner_channel_minor]	Indicates the subchannel number of the channel that the receiver is currently tuned to, if any
[tuner_signal_quality]	Full range (0-100%) value representing the quality of the signal as reported by the tuner
[transponder_number]	The transponder number of the currently tuned channel

SERIAL OUTPUTS

directv_tx\$	Tie to TX\$ line of serial port that the DirectTV receiver is connected to
[primary_type]	The type of the primary (video) stream of the current channel; one of Data, Audio, Retired, Video-SDTV, Video-HDTV, or None.
[audio_type]	The type of the audio stream of the current channel
[cam_id\$]	The ID of the smart card inserted in the receiver

PARAMETERS

Receiver Model	Select the model of receiver that you are controlling from the drop-down list
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Support

This module is supported by ControlWorks Consulting, LLC. Should you need support for this module please email support@controlworks.com or call us at 440-729-4640. ControlWorks normal office hours are 9 AM to 5 PM Eastern, Monday through Friday, excluding holidays.

Before calling for support, please ensure that you have loaded and tested operation using the included demonstration program and touchpanel(s) to ensure that you understand the correct operation of the module. It may be difficult for ControlWorks to provide support until the demonstration program is loaded.

Updates, when available, are automatically distributed via Email notification to the address entered when the module was purchased. In addition, updates may be obtained using your username and password at <http://www.thecontrolworks.com/customerlogin.aspx>.

Distribution Package Contents

The distribution package for this module should include:

DirectTV_Receivers_V1.umc	Crestron User Module for control of DirectTV receivers
DirectTV_Receivers_Xpanel_v1.vtp.....	Demonstration XPanel
DirectTV_Receivers_v1_Demo.smw	Demo program for PRO2 processor
DirectTV_cam_id_parser_v1.usp	SIMPL+ File used within the module
DirectTV_cam_id_parser_v1.ush.....	SIMPL+ Header used within the module
DirectTV_Receivers_control_v1.pdf	This Help File

Revision History

V1 jim@controlworks.com, lincoln@controlworks.com 2008.05.30

-Initial release

Development Environment

This version the module was developed on the following hardware and software. Different versions of hardware or software may or may not operate properly. If you have questions, please contact us.

DirecTV Receivers	Software Version
HR20-700	0x4062
H20-600	0x4062
D10-100	0x1069
Crestron Hardware	Firmware Version
Crestron PRO2 Processor	3.155.1243
Software	Software Version
Crestron SIMPL Windows	2.08.38
Crestron Vision Tools Pro-e	3.7.2.8
Crestron Database	19.06.003
Crestron Symbol Library	531
Crestron Device Library	531

ControlWorks Consulting, LLC Module License Agreement

Definitions:

ControlWorks, *We*, and *Us* refer to ControlWorks Consulting, LLC, with headquarters located at 701 Beta Drive, Suite 22 Mayfield Village, Ohio 44143-2330. *You* and *Dealer* refer to the entity purchasing the module. *Client* and *End User* refer to the person or entity for whom the Crestron hardware is being installed and/or will utilize the installed system. *System* refers to all components described herein as well as other components, services, or utilities required to achieve the functionality described herein. *Module* refers to files required to implement the functionality provided by the module and may include source files with extensions such as UMC, USP, SMW and VTP. *Demo Program* refers to a group of files used to demonstrate the capabilities of the Module, for example a SIMPL Windows program and VisionTools Touchpanel file(s) illustrating the use of the Module but not including the Module. *Software* refers to the Module and the Demo Program.

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Provision of Support

We provide limited levels of technical support only for the most recent version of the Module as determined by Us. We do not provide support for previous version of the module, modifications to the module not made by Us, to persons who have not purchased the module from Us. In addition, we may decline to provide support if the Demo Program has not been utilized. We may withdraw a module from sale and discontinue providing support at any time and for any reason, including, for example, if the equipment for which the Module is written is discontinued or substantially modified. The remainder of your rights and obligations pursuant to this license will not be affected should ControlWorks discontinue support for a module.

Modification of Software

You may not decrypt (if encrypted), reverse engineer, modify, translate, disassemble, or de-compile the Module in whole or part. You may modify the Demo Program. In no event will ControlWorks Consulting, LLC be liable for direct, indirect, incidental or consequential damages resulting from You modifying the Software in any manner.

Indemnification/Hold Harmless

ControlWorks, in its sole and absolute discretion may refuse to provide support for the application of the Module in such a manner that We feel has the potential for property damage, or physical injury to any person. Dealer shall indemnify and hold harmless ControlWorks Consulting LLC, its employees, agents, and owners from any and all liability, including direct, indirect, and consequential damages, including but not limited to personal injury, property damage, or lost profits which may result from the operation of a program containing a ControlWorks Consulting, LLC Module or any component thereof.

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